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IN TWO SECTIONS

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EDITORIAL DEPARTMENT NOTE

In this issue of our Bulletin we are presenting two papers on a subject which should be of unusual interest at the present time. During the past three years industrial activity has been halted to the extent of almost completely curtailing all expenditures for new equipment. In fact, it has been observed that many companies have failed to make the repairs necessary to maintain their plants at a high degree of productive efficiency because the amount of production has not required it. Hence, at the present time there is probably a great amount of repair and maintenance work accumulated in many factories. Just as soon as there is a revival of industrial activity, this repair work will be resumed, and many shops will make extensive repairs rather than buy new machinery as business continues to improve.

In many instances there has been no serious attempt to distribute the cost of operating a repair or maintenance department among the departments served. These two papers explain how this has been done and offer suggestions as to how it may be done by other companies.

W. J. Madison, the author of the first paper, was graduated from the New York University School of Commerce with the B.C.S. degree. He started his business career in a law office. Then he entered the bookbinding business, after which he entered the employ of the Loose-Wiles Biscuit Company as assistant office manager in one of the branches. He has held the positions of agency auditor, assistant auditor of agency accounting, cashier, assistant to the sales manager and at the present time he is in charge of cost and production accounting. He is a member of our New York Chapter.

Charles L. Hill, the author of the second paper, after attending the public schools of Dayton, Ohio, received his preliminary training in accountancy at Miami-Jacobs College. His first position after graduation from college was that of stenographer in the Dayton office of the Johns-Manville Company. He left that position to accept a similar one in the office of William A. Ullrich, C.P.A. That was seven years ago, and he is now a senior accountant on the staff of the same firm. Mr. Hill has been a member of the Dayton Chapter since its formation.

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NATIONAL ASSOCIATION OF
COST ACCOUNTANTS

JANUARY 1, 1933

ACCOUNTING FOR REPAIRS AND MAINTENANCE

By W. J. Madison

In Charge of Cost and Production Accounting

Loose-Wiles Biscuit Company, New York, N. Y.

REPAIR work in a modern factory can be classified as:

(A) Emergency repair work;

(B) Maintenance work, including repairs in anticipation of possible break-down;

(C) Installation of new machinery or renovation of old machinery.

Under normal conditions there may be a large number of charges under (A); fewer charges, but these of greater amount each, under (B); and not many charges under (C) but each of them of considerable magnitude. It is commonly recognized that for cost and statistical purposes as well as for the general accounting records, exact information must be kept of charges under (C); not infrequently accurate information is kept of charges under (B) also. But charges under (A), on the other hand, are too often scanned with only superficial interest, with the result that they build up a large aggregate amount of expense which is promiscuously labelled "Burden" and forthwith relegated to obscurity.

Although this is not as it should be, executives are prone to consider it only a waste of time to spend any effort in ascertaining the distribution of repair and maintenance costs among departments. The mechanical repair department may contribute to this feeling by a reluctance to having a check made of its work, and this attitude may reinforce the feeling of the management that systems for ascertaining departmental costs of repairs involve so much clerical work that they incur more expense than they save.

The method of accounting for repairs in an organization must be worked out in many respects by the organization itself. A simple plan will be outlined here, however, for a system which charges all repair and maintenance expenses, including labor, material, depreciation and other standing charges to productive de-

partments and to burden on a scientific basis. The advantages to be derived from following it include:

(1) A record of all repairs and maintenance work done, and of its cost;
(2) A record of the time and material cost of designing new machines and of evolving improvements to old machines;
(3) A record of the cost of installation of fixed assets;
(4) Information showing whether the capitalized cost of repairs to a machine exceeds the cost of a new machine;
(5) Suggestions of possible economy in repair expense, especially that of a periodically recurring nature;
(6) Information for executive purposes.

In the operation of this system five printed forms are necessary. As illustrated, they are:

Form A, Repair Shop Time Card.

A card for each mechanic is placed in a rack, a fresh card being issued each day. On this card the mechanic records the department in which the work is done, details of the work done, materials and time consumed, the last-named being reported decimally, one-tenth of an hour for each six minutes.

Form B, request for repairs or new construction (Job Sheet). This form has headings for job number, date and description of the work to be done. Unless the request is for emergency work, a foreman must insert estimates of quantities of materials, number of men and time required; and the cost department must extend these figures and submit the form to the manager or superintendent for approval before the repair department may proceed with the work.

Form C, a statistical record kept by the cost department of all requests for repair jobs and new construction, and of the department making them. It is also the source of the numbers issued to Form B. This record may conveniently take the form of loose sheets in a binder; it carries serial numbers in vertical columns and as each request on a Form B is received, it is given the first unallocated number from Form C, on which, as a counter-record, is entered the number of the department making the request.

REPAIR SHOP TIME CARD

EMPLOYEE No. _____ DATE _____

DEPT. NO AND JOB NO	HRS.	RATE	AMOUNT	
TOTAL				

FORM A (FRONT)

MATERIAL USED

DEPT. OR JOB NO.	MATERIAL	QUANTITY	PRICE	AMOUNT	

FORM A (BACK)

REQUEST FOR REPAIRS OR NEW CONSTRUCTION

DESCRIPTION
NOTE—PUT DRAWING ON BACK OF THIS SHEET

NO.
DATE

SIGNED DEPT

TO BE FILLED IN BY REPAIR DEPARTMENT

ESTIMATED MATERIALS REQUIRED

ESTIMATED NO. OF MEN
ESTIMATED NO. OF HOURS
REMARKS:

COST DEPT SHT. OF COSTS
APPROVED
MANAGER OR SUPT.

JOB ORDER COST SHEET

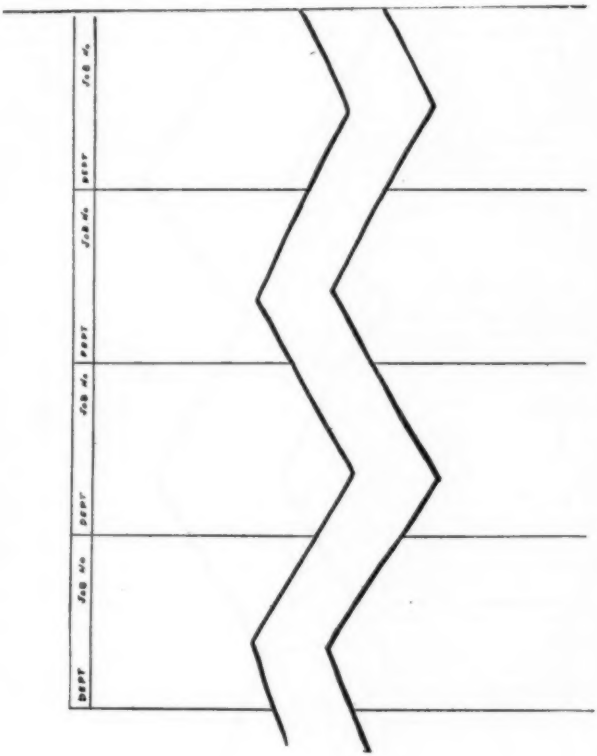
DATE STARTED DATE FINISHED

DATE	MATERIALS	AMOUNT	DATE	LABOR	AMOUNT

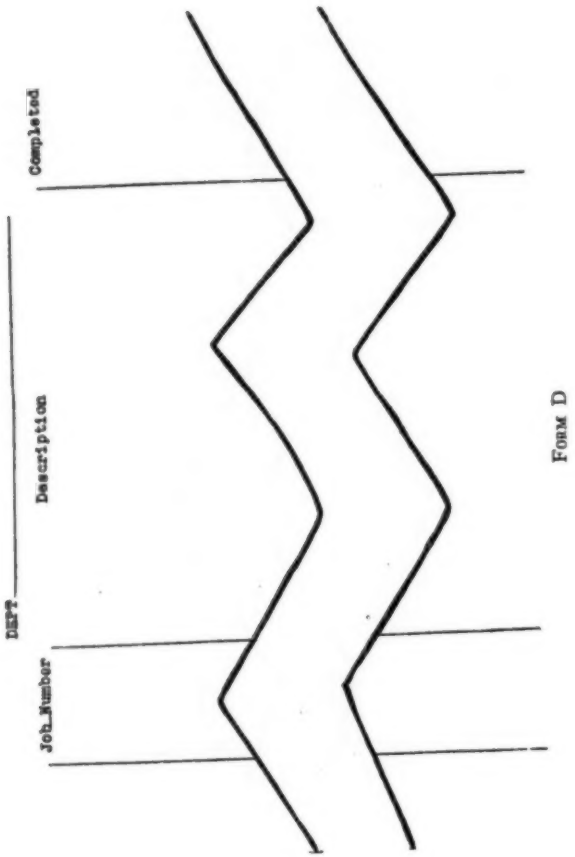
RECAPITULATION

TOTAL MATERIAL
TOTAL LABOR
MISCELLANEOUS CHARGES
TOTAL COST

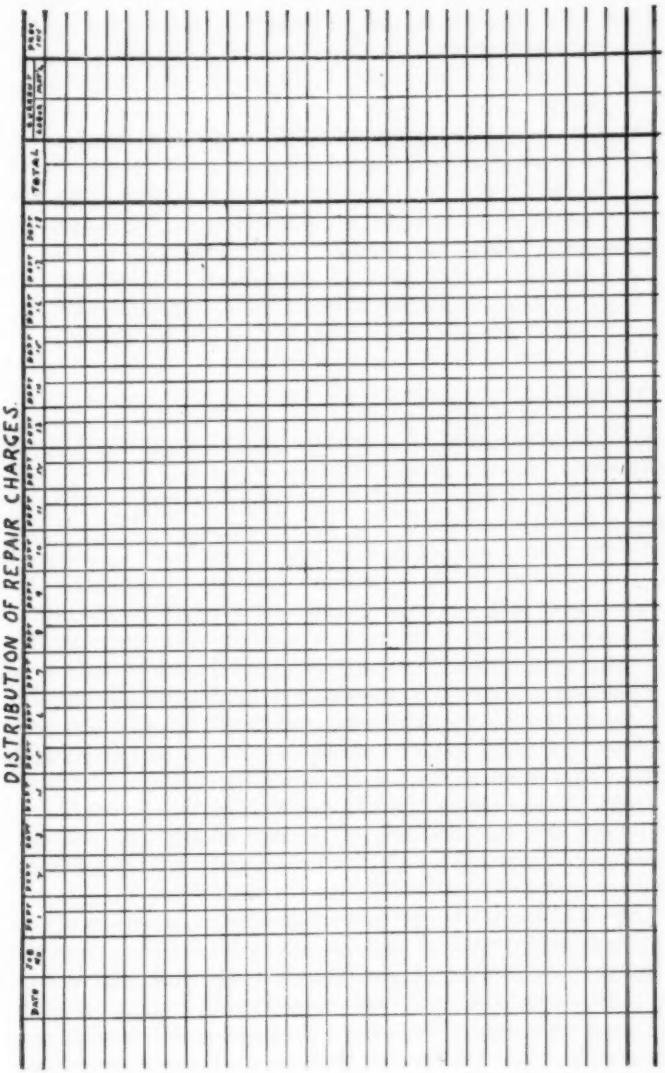
FORM B



FORM C



FORM D



FORM E

Form D, a departmental record prepared from Form C. This form carries the number and a brief description of jobs requested, and the dates of their authorization and completion.

Form E, a financial summary and distribution by departments of repair charges, prepared from the totals of each Form B. At the end of each month this form is totalled, the departmental totals being used in determining the amount of departmental repair expense for the period.

Form E is used also in reconciling the departmental (statistical) repair charges with the general ledger repair account. This process is described later.

The operation of the system is as follows:

(A) Emergency Repair Work

When a break-down of a machine occurs, the operator of it immediately notifies the foreman who calls the cost department and asks for a repair job number for Form B, giving, at the same time, a short description of the work to be done. The cost department issues the next open number from Form C, entering in it the number of the department making the request. The foreman next calls the repair department giving them the Form B number and details of the work to be done. The repair department thereupon dispatches a mechanic to put the machine in order.

This mechanic enters on his Form A the time of starting the job, the number of the department and the Form B number; on the back of his card he enters amounts and details of any material used. On completing the job, he enters the hour and the word "Completed," and reports to the foreman of the department.

If more than one mechanic is required on the job, each one working on it reports his own time, but materials are reported only by the man withdrawing them from the stock-room.

The foreman of the productive department, after notifying the repair department of the completion of the job, forwards Form B to the cost department where it is placed in a file awaiting the mechanic's Form A which, incidentally, is approved each day by his foreman. From Form A the time and material are priced and extended on the Job Sheet, Form B, which is stamped "Completed." An entry recording completion of the job is also

made on Form D, which is written up in other respects from Form C. In emergency work, no estimates are entered on Form B.

The figures on Form B are scrutinized and if they appear abnormal in amount, a request is made to the repair department foreman for an explanation, which is recorded and filed with Form B.

Form B is next entered on Form E, the information recorded being the job number, date of completion and total cost, which is entered under the department number. The separate totals for materials and labor are entered in the columns headed "Current," as a memorandum for purposes of reconciliation to be described later.

If the job runs into more than one accounting period, the inventory amount or total charges up to the end of the preceding period are entered in the last column headed "Previous Inventory." On Form B it is treated as an uncompleted job and the total cost is accumulated there from month to month; but on Form E the charges for each month are treated as repair expense for the month in which the work is done.

(B) Maintenance Work, Etc.

This type of work is not usually of a nature urgently requiring attention in order to maintain production, although it may be so upon occasion, as floor repairs, addition of a part to a machine or fixture, moving a machine, or work resulting from changes in the method of production. It is, of course, expected to be of benefit in increasing production, bringing about more efficient operation, etc. Often it is expensive since the plan of its execution may be changed before its completion and in consequence the actual expense may greatly exceed the amount originally estimated.

The procedure is as follows:

The applicant for the work asks the cost department for a Form B number, giving a short description of the operation contemplated. On Form B he fills in this description and forwards the form to the superintendent or manager who gives the request his consideration or turns it down. If it is approved for estimate, Form B is sent to the head of the repair department to

have listed on it the time and materials required and the number of men necessary; it is not expected, naturally, that every detail of material will be enumerated, small items such as nuts, bolts and screws will be grouped under one heading.

Form B is next sent to the cost department for pricing and extension, thereafter being returned to the superintendent or manager who decides from the figures before him whether it is desirable to have the work done. If the work is to proceed, the superintendent or manager approves Form B, which then goes to the repair department as notice that the work is to be put in hand.

The same routine detail follows as that outlined for emergency jobs. Upon completion of the work, the cost department compares the actual and the estimated costs and if there is any serious discrepancy between them obtains an explanation of it from the head of the repair department.

(C) Installation of New Machines, Etc.

On account of altered or improved methods of manufacture, a machine may become obsolete, but the head of the department using it may feel that a small outlay would modernize it to make it as serviceable as a new machine.

When work of this nature is to be done, the same procedure as in (B) is followed.

Jobs of this type are treated differently only in that the expense is capitalized instead of being charged to profit and loss.

Some plants detail a maintenance man to a group of machines or to a floor; the accounting policy in force will determine whether this man's time is to be charged to the repair department or to the burden expense of the machines or floor. Many small jobs such as elevator repairs, belting repairs, greasing and oiling of machinery, inspection and repair of steam lines, etc., require only a few minutes attention each day. For all such work one Form B should be used each month; it receives only one job number and at the end of the month is posted in total to Form E.

At the end of each month certain jobs will not have been completed; some of them will be work which is eventually to be capitalized, but the majority will probably be repairs. Each Form B, however, is sub-totalled for the month, the material and labor figure for the period being posted to Form E.

The method of correlating the information compiled on Form E with the general ledger records is now described.

Two accounts are required in the general ledger:

The first is entitled "Repair Expense Account"; the second, "Work in Process" or "Uncompleted Jobs." All expenses chargeable to the repair department for materials, labor, superintendents' salaries, depreciation, etc. are debited to the former account through the voucher register, cash book and journal respectively, credits to the account finding their way to it through the same channels. The purposes of the latter account will be described a little later.

The repair department inventory is taken at the end of every month. Its value at the beginning of each month is debited to the repair expense account, and its value at the end of the month is credited to this account, so that the net monthly debit for materials is the quantity absorbed in carrying out repair and construction work for the period. In theory, this figure should exactly equal the total of the "Materials" column on Form E, but in practice it will generally exceed it to a greater or less degree by reason of small quantities left over from jobs being treated as waste instead of being returned to store, and because of all the other reasons which account for minor shortages in stores inventory.

This comparison between the repair expense account and Form E serves the valuable purpose, it will be seen, of disclosing promptly any large deficiency or excess in the quantities of materials in store, since no substantial error can remain undetected for more than a month.

All other charges to the repair expense account will be figures appropriate to the period. The only one of them which has a counterpart in Form E is labor, and here again the amount in the repair expense account will exceed the total on Form E, since almost inevitably there will have been lost time—that is, time not chargeable to any job.

Form E is the scale-pattern for distribution of the charges in the repair expense account to departments. There are two alternative ways of using it, and for the sake of clearness in illustration it will be supposed that there are six productive departments, for which on Form E the following figures for the month appear:

	Amount	*Per cent of total*
Department (1)	$ 600.00	20
Department (2) (work in process)	270.00	9
Department (3)	720.00	24
Department (4)	210.00	7
Department (5)	900.00	30
Department (6)	300.00	10
	$3,000.00	100

The charges in the repair expense account are:

Labor		$2,750.00
Materials		1,250.00
Other charges:		
Foremen and superintendents	$700.00	
Administrative expense	150.00	
Depreciation of machinery, repair department	120.00	
Small tool expense	30.00	
		1,000.00
		$5,000.00

Method (1)

The charges as determined on Form E are credited to the repair expense account and debited to the productive departments. This leaves in the repair expense account all charges not included in Form E, viz.:

Labor and materials	$1,000.00
Other charges	1,000.00
	$2,000.00

These unabsorbed charges are then eliminated from the repair expense account and distributed to the productive departments according to the percentages shown above.

The complete distribution to departments is as follows:

	%	*Amount*	
Department (1):			
Amount per Form E		$600.00	
Unabsorbed expenses	20	400.00	
			$1,000.00
Department (2) (work in process):			
Amount per Form E		$270.00	
Unabsorbed expenses	9	180.00	
			450.00
Department (3):			
Amount per Form E		$720.00	
Unabsorbed expenses	24	480.00	
			1,200.00

Department (4) (repair department):			
Amount per Form E		$210.00	
Unabsorbed expenses	7	140.00	
			350.00
Department (5):			
Amount per Form E		$900.00	
Unabsorbed expense	30	600.00	
			1,500.00
Department (6):			
Amount per Form E		$300.00	
Unabsorbed expense	10	200.00	
			500.00
Total repair expenses for month			$5,000.00

Method (2)

All charges in the repair expense account are distributed to productive departments according to the percentages determined on Form E.

Under this method the figures are:

	%	*Amount*
Department (1)	20	$1,000.00
Department (2) (work in process)	9	450.00
Department (3)	24	1,200.00
Department (4) (Repair department)	7	350.00
Department (5)	30	1,500.00
Department (6)	10	500.00
		$5,000.00

Alternatively to the above two methods, the following bases may be adopted, producing, possibly, more precise results than the foregoing, but entailing more detail on Form E on which two additional columns for each department will be required, one for labor and the other for materials. On the assumption that it has been ruled in this way, the figures used in the illustration above may be subdivided thus:

	Labor		*Material*		*Total*	
	Amount	*% of total*	*Amount*	*% of total*	*Amount*	*%*
Department (1)	$ 550.00	27.5	$ 50.00	5	$ 600.00	20
Department (2)	50.00	2.5	220.00	22	270.00	9
Department (3)	300.00	15.0	420.00	42	720.00	24
Department (4)	100.00	5.0	110.00	11	210.00	7
Department (5)	750.00	37.5	150.00	15	900.00	30
Department (6)	250.00	12.5	50.00	5	300.00	10
	$2,000.00	100.0	$1,000.00	100	$3,000.00	100

The charges in the repair expense account are:

Labor		$2,750.00
Materials		1,250.00
Other charges:		
Foremen and superintendents	$700.00	
Administration expense	150.00	
Depreciation of machinery, Repair department	120.00	
Small tool expense	30.00	
		1,000.00
		$5,000.00

Method (1) (Alternative):

The amounts of labor and material as determined on Form E are credited to the repair expense account and debited to the productive departments. This leaves in the repair expense account all charges not included in Form E, viz:

Labor	$ 750.00
Materials	250.00
Other charges	1,000.00
	$2,000.00

These unabsorbed charges are next eliminated from the repair expense account and distributed to the productive departments, labor according to the departmental percentage of labor, material according to the departmental percentages for materials, and other charges according to the composite percentage of labor and materials.

This distribution is as follows:

	%	*Amount*	
Department (1):			
Labor and materials, per Form E...		$600.00	
Unabsorbed expenses:			
Labor	27.5	$206.25	
Materials	5	12.50	
Other charges	20	200.00	
		418.75	
			$1,018.75
Department (2) (Work in process):			
Labor and materials, per Form E...		$ 270.00	
Unabsorbed expenses:			
Labor	2.5	$ 18.75	
Materials	22	55.00	
Other charges	9	90.00	
		163.75	
			433.75

Department (3):				
Labor and materials, per Form E....			$720.00	
Unabsorbed expenses:				
Labor	15	$112.50		
Materials	42	105.00		
Other charges	24	240.00		
			457.50	
				1,177.50
Department (4) (Repair department):				
Labor and materials, per Form E...			$210.00	
Unabsorbed expenses:				
Labor	5	$ 37.50		
Materials	11	27.50		
Other charges	7	70.00		
			135.00	
				345.00
Department (5):				
Labor and materials, per Form E...			$900.00	
Unabsorbed expenses:				
Labor	37.5	$281.25		
Materials	15	37.50		
Other charges	30	300.00		
			$618.75	
				1,518.75
Department (6):				
Labor and materials, per Form E...			$300.00	
Unabsorbed expenses:				
Labor	12.5	$ 93.75		
Materials	5	12.50		
Other charges	10	100.00		
			206.25	
				506.25
Total repair expense for month				$5,000.00

Method (2) (Alternative):

All charges in the repair expense account are distributed to productive departments in accordance with the percentages determined on Form E, labor and materials to their respective departmental percentages, and other charges according to the composite percentage.

Under this method the figures are:

	%	*Amount*	
Department (1):			
Labor	27.5	$756.25	
Materials	5	62.50	
Other charges	20	200.00	
			$1,018.75
Department (2): (Work in process):			
Labor	2.5	$ 68.75	
Materials	22	275.00	
Other charges	9	90.00	
			433.75

Department (3):			
Labor	15	$412.50	
Materials	42	525.00	
Other charges	24	240.00	
			1,177.50
Department (4) (Repair department):			
Labor	5	$137.50	
Materials	11	137.50	
Other charges	7	70.00	
			345.00
Department (5):			
Labor	37.5	$1,031.25	
Materials	15	187.50	
Other charges	30	300.00	
			1,518.75
Department (6):			
Labor	12.5	$343.75	
Materials	5	62.50	
Other charges	10	100.00	
			506.25
			$5,000.00

It will be seen that both methods, whichever basis of distribution is used, produce precisely the same figures for each department; the choice between them is a matter of individual preference. The former method, although a little longer, has the advantage of showing separately the direct and the indirect components of the total charge. The latter method is undoubtedly shorter and quicker.

Department (2), it will be noticed, is headed "Work in process," since the job being done there was incomplete at the end of the month. The amount of $433.75 is therefore transferred to the "Work in process" or "Uncompleted Jobs" account. Upon completion of the job in some succeeding period, the total to the debit of Department (2) in the "Work in process" account will be transferred either to the repair expense account of that department or to a fixed asset account in the general ledger.

The expense of Department (4), the repair department itself, is general plant burden.

In conclusion, it may be said that many manufacturing organizations neglect to analyze carefully their repair and maintenance expenses and remain content to consider them a necessary evil of the modern system. A simple procedure, however, such as that outlined herein can effect considerable savings which will pay many times over for the small expense entailed in printing forms and for the time and labor required for its operation.

ACCOUNTING FOR MAINTENANCE

By Charles L. Hill, William A. Ullrich & Company, Certified Public Accountants, Dayton, Ohio

IN THE past maintenance of equipment, like accounting departments, has often been considered one of those necessary evils with which the employers of machinery must contend. But just as executives have awakened to the fact that accounting departments are bureaus of valuable information, so factory superintendents have learned the importance of proper plant maintenance.

The day when each machine operator was his own machine repairman has passed, and in his stead is found a fully equipped maintenance department, employing men whose duty it is to keep machinery functioning properly and efficiently.

There are, of course, manufacturing concerns, some of considerable size, wherein no definite repair department is maintained. Repairs, however, are not made promiscuously; all work is done on maintenance orders issued through the proper channels. The methods followed by one of these firms is outlined in later paragraphs.

The importance of maintenance from the standpoints of preservation of property and the facilitation of production warrants a thorough study of this department's activities and a current analysis of its costs.

Proper planning and scheduling of repairs is necessarily a part of the department's work. Association and trade journals have described some very effective methods now in use; these plans, however, are too detailed for discussion in this article.

Regular inspections should be made of equipment, and small defects adjusted at once. This procedure will often prevent a serious break-down, and will do much toward keeping down the costs of maintenance and major repairs. It is impossible to entirely eliminate major repairs, but when possible these should be taken care of when equipment is not in use, thus avoiding special shut-downs and interruptions in the flow of production.

Before going further into this discussion it may be well to have an understanding concerning the items included in a list of

accounts for a maintenance department. Burden of the departmet will be represented by the usual expenses: indirect labor, supplies, heat, light, power, industrial insurance, fixed charges, apportioned charges from service departments, etc. Whether or not materials used and direct labor should be included in the list of accounts is subject to divided opinion. Owing to the fact that materials and direct labor can be definitely measured and allocated, these costs may be charged directly to the proper expense or asset account from material requisitions and payroll recaps. The objection to this plan is that total maintenance costs will not be recorded in one place. The best plan, therefore, is to record these costs in materials and direct labor accounts in the maintenance department. Correct distributions may still be made from requisitions and recaps, and there is the added advantage of control over total maintenance costs.

The following types of repair orders will be encountered frequently:

1. Repairs to equipment made by men in that department,
2. Repairs to equipment made by men transferred from another department,
3. Repairs made through use of equipment of another department,
4. Building new equipment, or performing work the cost of which will be capitalized or charged to a general ledger expense account,
5. Repairs to equipment of a department made by the maintenance department,
6. Building or installing new equipment, etc., by the maintenance department.

Figures No. 1 and 2 are representative of the cost copies of order forms issued for repair work as outlined above. These orders may be closed monthly or when the work is finally finished.

Orders such as those listed under Nos. 1, 2, 3, and 4 are representative of the kind issued by the plant maintaining no repair department.

The time of a workman spent in repairing machinery in his own department is charged from the payroll recaps to a separate "Repair Labor" account. The cost of repairs made by men transferred from another department is also charged to this

WORK TO BE DONE | DATE ISSUED | FACTORY ORDER NO.

DATE STARTED | DATE FINISHED | CHARGES TO OR ACCT. NO

MATERIALS				LABOR RECORD					BURDEN			TOTAL COST
DATE	ITEM	PRICE	AMT.	CLOCK NO.	DATE	HOURS	RATE	AMT.	DEPT. OR MACHINE	RATE	AMT.	

FIGURE 1

ORDER ISSUED TO

WORK TO BE DONE

FROM

CHARGE TO OR ACCT. NO.

FACTORY ORDER NO.

DATE ISSUED

DATE BEGUN

DATE FINISHED

MATERIALS AND EXPENSE				LABOR RECORD						BURDEN		
DATE	ITEM	PRICE	AMOUNT	DATE	CLOCK NO.	LABOR %	HOURS	RATE	AMOUNT	DEPT.	RATE	AMOUNT

MATERIALS

LABOR

BURDEN

TOTAL COST

FIGURE 2

account. Under such conditions a man is properly an employee of the department to which he has been transferred and his time should be recapped accordingly. Neither of these two orders will include any burden charges. The cost copy of the order serves as a check on labor distributions. The "Repair Labor" account is set up as a division of indirect labor and is kept separated from outside repair costs.

Repairs for one department made through the use of equipment of another department are in effect production orders and bear burden of the department in which the work is done. Materials used and direct labor on these orders is charged to the department making the repair. When the order is finished, this department is credited with the cost of the material used, the direct labor, and a proper portion of burden. These credits are recorded in a departmental credit account, analyzed as to material, labor and burden. The maintenance account of the department for which the work was done is charged with this total cost. For purposes of determining departmental burden rates, direct hours on these orders are recapped in the department in which the work is done.

When the equipment of a department is used in the manufacture of new equipment, or when the work is of such nature that it will be capitalized or charged to a general ledger expense account, materials used and direct labor are accounted for in the manner outlined above, and burden is added to the orders on the basis of the departmental rate. When the order is completed, however, the credit will be made to work-in-process instead of the departmental credit account. The theory in each of these cases is that charges to the producing department should not be disturbed. In the first instance unless a credit is entered in the factory ledger, this record will be over-stated by the amount of the charge to the department for which the work was done. Therefore the credit account has been introduced, through which the desired results are obtained without disturbing total departmental charges. In the second instance, however, the final charge is not to a factory ledger account, and a credit to this record would have the effect of reducing production costs.

Employees who have been taken from their regular work to help in installation of new equipment, construction of a building, etc., are functioning in the capacity of outside laborers and are

not accounted for in their own department until they return to their regular work. Their wages are charged directly to the asset account affected. No burden is applied to these orders unless the facilities of a department are used for making a part to be used in construction or set-up.

The methods described above have been used successfully for several years in a large manufacturing plant. Whether or not it would be advisable for this company to maintain a repair department is a question which cannot be discussed here.

Let us now turn our attention to a plan recently proposed to the author of distributing maintenance on the basis of units produced. Based upon previous experience, a fixed charge would be determined at the beginning of a year and a department would be charged for repairs upon the basis of the number of parts, pieces or units produced during the month. Consequently if production for a month was high, there would be a large charge for maintenance, and if production was low, the maintenance charge would be small. Such a plan would not give a foreman the proper incentive for keeping down maintenance costs. His monthly report would show unfavorable maintenance costs when production was good, and perhaps questionably low maintenance costs during a month of inactivity when possibly all equipment was given a thorough servicing. Over a period of a year the plan may prove successful. Maintenance however is a service, and as such should be distributed upon the basis of service rendered.

The most logical basis for distributing maintenance costs is on the basis of the work done for other departments. Under this plan there can be no doubt concerning the direct material and direct labor charges; the repair order will indicate these clearly. There is more than one method however for distributing the burden of a maintenance department, and each has its advantages.

Under one method, maintenance department overhead is distributed to other departments on the basis of the number of hours worked for each department. This distribution is made monthly, the entire amount of burden being distributed over the orders worked on during that particular month. Inasmuch as maintenance department burden will remain fairly uniform from month to month, overhead charges will be greater during periods of few

repairs than during periods of many repairs. Due to these fluctuations, the cost of the same kind of repairs may vary considerably from month to month, with the result that foremen will not have the proper incentive for keeping down repair costs.

Another plan considers the maintenance department a producing department and under this plan maintenance burden is distributed to other departments on the basis of a regular hourly burden rate. The foreman now has an incentive; if he will watch closely the quantity and quality of materials used and the time spent by the maintenance gang, he can keep down his repair costs. The disadvantage of this plan is that total maintenance department burden may or may not be entirely distributed. The burden rate, however, should be determined with as much care as that of any other department, and the balance may be closed into under- or over-absorbed burden at the end of the year. It may also be distributed arbitrarily over the orders completed by the maintenance department during the year.

Under another plan only materials used and direct labor are distributed monthly. Burden is collected until the end of the year and then entirely distributed on the basis of hours worked for other departments. The departmental statements will then include only those charges for maintenance over which the foremen have direct control. It will be necessary, however, to keep an accumulated recap of hours worked for a basis of distributing overhead.

In the author's opinion, the best plan is to distribute maintenance department burden monthly on the basis of an hourly rate. It should be the purpose of any plan of distribution to keep repair costs uniform, giving foremen as much inducement as possible to lower this expense. If the plan will do this, it has merits to which no one can object.

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